

Remarks

Claim 1 has been amended to a fuel composition comprising a gasoline and a combination of a hydrocarbyl-substituted polyamine, derived from a high molecular weight polyisobutylene, and a Mannich reaction product, derived from a phenol, formaldehyde and a high molecular weight high vinylidene containing polyisobutylene, where the weight ratio of the polyamine to the Mannich is near a 1:1 ratio at about 0.75:1 to 1:0.75. With the amendment of claim 1 to include embodiments of claims 7 and 9-11, claims 7 and 9-11 have been canceled and claims 6, 12 and 13 have been amended for proper antecedent basis. Finally new claims 16 and 17 have been added depending from claim 1 with embodiments respectively of a polyamine to Mannich weight ratio of about 1:1 and where the fuel composition further comprises a fluidizer at a weight ratio of fluidizer to detergents of less than 0.2.

Support for the amendment of claim 1 can be found in former claims 7 and 9-11, on lines 5 and 17 of page 4, on lines 6-7 of page 6, and on line 18 of page 8. Support for new claim 16 can be found on line 18 of page 8, and for new claim 17 support can be found on lines 21-25 of page 8.

Claims 1, 3 and 6-15 were rejected under 35 U.S.C. 103(a) as being unpatentable for obviousness over Malfer et al. (U.S. 5,725,612) in view of Aiello et al. (U.S. 5,006,130).

Malfer et al. disclose in the abstract a highly effective Mannich detergent for use in spark ignition fuels (gasoline) where the Mannich detergent is further enhanced in reducing intake valve deposits and sticking by including a carrier fluid (fluidizer). Malfer et al. further disclose that an additive concentrate of their invention can contain the Mannich detergent and optionally can contain a small amount of one or more additives to include ancillary detergents. Malfer et al. further disclose in column 8 that a fuel composition of their invention is formulated with sufficient Mannich detergent and carrier fluid to inhibit or reduce deposits. The Mannich detergent can be present at 19-576 ppm (after converting pounds per thousand barrels or PTB to ppm by multiplying PTB by the conversion factor 3.84) or preferably at 38-384 ppm in a fuel composition. The carrier fluid can be present in the fuel composition at 19-864 ppm or preferably at 38-576 ppm. Aiello et al. disclose in their abstract a combination of a high molecular weight polyamine detergent derived from an

olefinic polymer and a carrier in a fuel to reduce intake valve deposits. Aiello et al. are silent on including an additional detergent with the polyamine detergent.

Amended claim 1 is a fuel composition comprising a gasoline and a combination of a Mannich detergent, derived from a phenol alkylated with a high molecular weight high vinylidene content polyisobutylene and formaldehyde, and a polyamine detergent, derived from a high molecular weight polyisobutylene, where the weight ratio of polyamine detergent to Mannich detergent is about 0.75:1 to 1:0.75, each of the detergents is present at 20-110 ppm, and the detergents in combination are present at or greater than 60 ppm. New dependent claim 17 is the fuel composition of claim 1 further comprising a fluidizer at a weight ratio of fluidizer to the detergents in combination that is less than 0.2. The cited references Malfer and Aiello in combination do not disclose or suggest the unexpected effectiveness and efficiency of the fuel composition of amended claim 1 and new dependent claim 17 in controlling intake valve deposits which is clearly demonstrated by the Examples in Tables 1 and 2 on page 11 of the application. The fuel composition of claim 1 is commensurate with Examples 5 and 8 which are greatly improved on deposits when compared respectively to Examples 1-3 or 6-7. The fuel composition of claim 17 is commensurate with Example 4 which is greatly improved on deposits when compared to Examples 1-3. Inventive Examples 4, 5 and 8 are unexpectedly effective and efficient in controlling deposits because they provide a significantly greater reduction in deposits using less fluidizer and/or detergent actives compared to Examples 1-3 and 6-7 which contain a single detergent and a fluidizer. While Malfer and Aiello clearly disclose the combination of a polyamine detergent and fluidizer or the combination of a Mannich detergent and fluidizer which is demonstrated in Examples 1-3 and 6-7 of this application, they do not disclose or suggest the unexpected effectiveness and efficiency of the combination of a polyamine detergent and Mannich detergent of Examples 5 and 8 or the combination of a polyamine detergent and Mannich detergent further comprising a small amount of fluidizer of Example 4.

The applicants submit that claim 1 and dependent claims 3, 6, 8 and 12-17 are patentable over Malfer in view of Aiello based on the unexpected effectiveness and efficiency of the inventive fuel compositions in controlling deposits.

Malfer discloses on lines 28-43 of column 8 that an additive concentrate containing 12-69% and preferably 22-50% of a Mannich detergent can optionally contain small amounts up

to 10% and preferably up to 5% of one or more ancillary detergents which can be equated to an ancillary detergent to Mannich detergent ratio of 0.14 - 0.83:1 (where $0.14=10/69$ and $0.83=10/12$) and preferably 0.1 - 0.23:1 (where $0.1=5/50$ and $0.23=5/22$). Aiello discloses a polyamine detergent but is silent on combining it with other detergents. Malfer and Aiello in combination suggest combining a polyamine detergent and a Mannich detergent in a polyamine detergent to Mannich detergent ratio of 0.14 - 0.83:1 or 0.1 - 0.23:1. Malfer and Aiello in combination do not disclose or suggest the polyamine to Mannich ratio of about 1:1 of new claim 16. Furthermore, Malfer and Aiello do not disclose or suggest the unexpected effectiveness and efficiency of the fuel composition of claim 16 in controlling deposits as was previously presented hereinabove where the fuel composition of claim 16 is commensurate with inventive Examples 5 and 8.

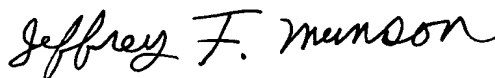
The applicants submit that claim 16 is patentable over Malfer in view of Aiello because these references do not disclose or suggest the about 1:1 detergent ratio or the unexpected effectiveness and efficiency of the about 1:1 detergent ratio.

From the foregoing amendments and remarks, it is submitted that the present claims are in condition for allowance and that the reply to this Office Action is fully responsive. An early and favorable reconsideration is respectfully requested. If the Examiner believes that only minor issues remain to be resolved, a telephone call to the undersigned is suggested.

Any deficiency or overpayment in fees for this application should be charged or credited to Deposit Account No. 12-2275 (The Lubrizol Corporation).

Respectfully submitted,

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